



Stormwater Quality Programs in the Puget Sound Basin



Managing Stormwater Quality and Quantity

Historically, stormwater management has meant controlling water quantity, usually flood control of large storm events. Now we know how important it is to manage the stormwater runoff from smaller storms as well. In fact, small amounts of stormwater runoff routinely run away with large amounts of soil and pollutants. Pollutants include oil and grease, pesticides and fertilizers, harmful bacteria, and metals such as lead, cadmium and copper.

Many problems and solutions related to stormwater quantity and quality are interrelated. For example, streambank erosion is a water quality problem that is quantity based. Urbanization generally results in an increase in surface runoff during the rainy months, causing flooding and erosion problems that are readily recognized. The increase in surface runoff is directly related to increased impervious surfaces that come with developments such as roads, parking lots, and rooftops. Impervious surfaces prevent runoff from soaking into the ground. In turn, flooding and erosion result in increased suspended solids, a water quality problem that can choke fish and ruin spawning habitat.

Another link between stormwater quantity and quality is that the more stormwater runs off impervious surfaces, the less water there is to recharge ground water. This, in turn, can ultimately result in decreased summer stream flows. Low stream flows can hurt fish and wildlife, and less water can also mean higher pollution concentrations in the stream.



What Goes Down The (Storm) Drain

Testing of stormwater has found it to contain high concentrations of heavy metals, fecal coliform bacteria, silt, petroleum products, and nutrients. In the short term, these type of toxic pollutants can stress aquatic organisms, damage shellfish beds, and restrict water recreation. In the long term, accumulation of pollutants in receiving waters can create problems, sometimes impossible to reverse, such as eutrophication (excessive algae growth), groundwater contamination, and contaminated sediments.

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Puget Sound volunteers stencil a storm drain with message: "Dump No Waste Drains to Stream"



Stormwater Programs That Affect You

In recent years several programs and policies have been established to effectively manage the quality of urban stormwater in the Puget Sound basin, including:

1. The Puget Sound Water Quality Management Plan (Puget Sound Plan), implemented by the Puget Sound Water Quality Authority (Authority).
2. The Puget Sound Stormwater Management Program, implemented by the Washington State Department of Ecology (Ecology).
3. The National Pollutant Discharge Elimination System (NPDES) stormwater permit program, promulgated by the Environmental Protection Agency and implemented locally by Ecology.
4. Many local government stormwater programs, including several that are among the most progressive in the nation.

The goal of the Puget Sound Plan is to:

- ▼ Protect and restore beneficial uses of aquatic resources, including shellfish beds, fish habitat, and other resources;
- ▼ Prevent contamination of sediments from urban runoff;
- ▼ Meet standards for water and sediment quality by reducing pollutant discharges from stormwater throughout Puget Sound.

As part of the stormwater provisions of the Puget Sound Plan, Ecology has developed minimum requirements for new developments and redevelopments. Recognizing that controlling stormwater at its source is the most efficient and cost effective method, the minimum requirements address site-specific impacts of individual projects. By July 1994, all jurisdictions in the Puget Sound basin are to have adopted the minimum requirements.

In many ways the federal regulations for the stormwater NPDES permit complement and reinforce the stormwater elements of the Puget Sound Plan.



BEST MANAGEMENT PRACTICES (BMPs)

What Are They?

Best management practices (BMPs) are defined as physical, structural, or management practices that, when used singly or in combination, prevent or reduce pollution of water. Specific BMPs have been developed by Ecology to control stormwater runoff (quality and quantity) for protection of receiving waters.

What Do BMPs Do?

Specific BMPs that cover stormwater runoff quality and quantity have been included in Ecology's Technical Manual. Those BMPs can be divided into three basic categories, including source control BMPs, runoff treatment BMPs and streambank erosion control BMPs.

Source Control BMPs are designed to prevent pollutants from entering stormwater by eliminating the source of pollution or by preventing contact of pollutants with rainfall and runoff. Source controls are usually the most cost-effective because they reduce or eliminate the need for treatment BMPs. Implementing source control BMPs generally involve relatively simple and straightforward actions. Examples of source control BMPs include erosion control (e.g., covering disturbed soil), covering material storage areas, and eliminating illicit discharges.

Runoff Treatment BMPs are designed to remove pollutants contained in stormwater runoff. These types of BMPs are the second line of defense in protecting stormwater quality. Examples of runoff treatment BMPs include infiltration basins, biofiltration swales, and sediment ponds.

Streambank Erosion Control BMPs are designed to protect stream ecosystems from erosion and sedimentation. Types of streambank erosion control BMPs include flow attenuation BMPs for reducing peak flows from a development (e.g., detention ponds, infiltration trenches), and streamside stabilization BMPs used to stabilize eroding streambanks.

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Highlights of Puget Sound Basin Stormwater Quality Management Programs

<i>Program</i>	<i>Who Must Respond?</i>	<i>What Must They Do?</i>
Puget Sound Water Quality Management Plan: Basic Stormwater Program	All cities and counties within the Puget Sound basin	<p>Develop stormwater management programs and adopt ordinances that include minimum requirements “substantially equivalent” to the Technical Manual, and meet operation and maintenance requirements by July 1, 1994.</p> <ul style="list-style-type: none"> ■ Control stormwater quality from all public and private development and redevelopment. ■ Develop operation and maintenance programs for all new and existing public and private stormwater facilities. ■ Applicants for any new or redevelopment project within these jurisdictions must meet minimum requirements of local ordinances, showing compliance in stormwater site plans.
Puget Sound Water Quality Management Plan: Comprehensive Program for Urbanized Areas	Designated urbanized areas (US Census Bureau)	<p>Implement additional requirements for comprehensive urban stormwater programs including:</p> <ul style="list-style-type: none"> ■ Schedule Summary ■ Program to identify and correct stormwater pollution sources. ■ Water quality response program. ■ Cooperative actions in watersheds shared by other jurisdictions. ■ Stormwater public education program
Puget Sound Stormwater Management Program	Washington State Department of Ecology	<p>Prepare guidance to local governments for implementing requirements of the Puget Sound Water Quality Management Plan.</p> <p>Prepare technical manual defining minimum requirements for all new and redevelopment, and design criteria for best management practices and stormwater site plans.</p>
Industrial National Pollutant Discharge Elimination System Program (NPDES)	<p>Industrial and certain municipal facilities with point source stormwater discharges to surface and/ or to municipal storm sewers</p> <p>Construction activities disturbing more than 5 acres</p>	<p>Develop and implement “stormwater pollution prevention plan” (SWPPP)” Deadlines vary depending on type of project and whether it is an existing or new discharge.</p> <ul style="list-style-type: none"> ■ For industrial discharges, a SWPPP should include management measures such as source control and capital facilities where necessary to provide runoff treatment. ■ For construction activities, a SWPPP should include an erosion and sediment control plan.
Municipal National Pollutant Discharge Elimination System Program (NPDES)	<p>Currently: Municipalities with populations greater than 100,000</p> <p>Washington State Department of Transportation</p>	<p>For existing systems: inventory, monitor, identify pollutant sources, and develop regulations to limit illicit discharges.</p> <p>Identify and commit to three year program of implementing best management practices to reduce pollutant loadings to meet water quality standards.</p>

Why Use BMPs?

There are three main reasons for applying BMPs before considering advanced treatment.

First, it has been shown through research and experience that BMPs can significantly reduce pollutants in stormwater. Using BMPs to control localized discharges is cost effective in comparison to treating large volumes of water.

Second, our lakes and streams depend on stormwater to provide adequate flow for fish habitat and water quality. Our groundwater resources also depend on stormwater for recharge. BMP implementation offers a way to discharge water back into the natural system.

Third, and perhaps most important, stormwater management programs demand the conscientious use of best management practices to protect water quality.

For more information on municipal stormwater requirements, or if you have special accommodation needs, please call the Urban Nonpoint Management Unit of Ecology's Water Quality Program at 206/438-7058. The agency's telecommunications device for the deaf (TDD) number is 206/438-8721. Ecology is an Equal Opportunity and Affirmative Action Employer.



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